

Evaluation of the new version of the laser-optical disdrometer, Parsivel

Ali Tokay, David B. Wolff, Jerry Wang, David A. Makofski, Walter A. Petersen, and Kurt Nemetz

Disdrometer based hydrometeor size distribution measurements have a wide range of application in radar meteorology among other disciplines. The low-cost laser optical disdrometer which became commercially available in 2005 opened a new era to study the variability of the hydrometeor size distribution. The pixel and footprint scale variability of the ground and spaceborne radar remote sensing of precipitation, respectively, has been investigated through a network of Parsivel disdrometers. At the same time, the cross comparison of impact-type, two-dimensional video and laser-optical disdrometers highlighted the relative strengths and weaknesses of each type of disdrometer. The Parsivel instrument tended to underestimate the number of small drops less than 0.8 mm in diameter quite severely, while the size of drops larger than 2.0 mm in diameter were overestimated at heavy rain quite frequently. Through a close collaboration with the manufacturer, these shortcomings were attributed to the inexpensive laser device. The manufacturer has just released a beta version of Parsivel2. The preliminary comparisons with old and new versions of Parsivel, impact type disdrometer and rain gauges showed a noticeable improvement of the Parsivel at both small and large drop end. This presentation will demonstrate the evaluation of the new unit and its potential impact on radar rainfall relations, including polarimetric and high frequency radar rainfall.